Amendments to the specification:

*Please amend the specification at paragraph 1 as shown below:

[0001] This patent application is a continuation in part of U.S. Patent Application No. 09/951,143, filed September 10, 2001 (published as US 2002-0076084 A1). This patent application is also a continuation in part of U.S. Patent Application No. 09/938,870, filed August 23, 2001 (published as US 2002-0099943 A1), which is a continuation in part of U.S. Patent Application No. 09/840,016, filed April 20, 2001 (now U.S. Patent No. 6,760,464). The above patent applications are hereby incorporated by reference.

*Please amend the specification at paragraph 5 as shown below:

[0005] Several particular watermarking techniques have been developed. The reader is presumed to be familiar with the literature in this field. Particular techniques for embedding and detecting imperceptible watermarks in media signals are detailed in the assignee's co-pending U.S. Patent Application No. 09/503,881 (now U.S. Patent No. 6,614,914) and U.S. Patent No. 5,862,260, which are hereby incorporated by reference. Examples of other watermarking techniques are described in U.S. Patent Application No. 09/404,292, which is hereby incorporated by reference. Additional features of watermarks relating to security, authentication of media signals and/or fragile watermarks are described in U.S. Patent Application Nos. 09/731,456 (published as US 2002-0031240 A1), 60/198,138, 09/498,223 (now U.S. Patent No. 6,574,350), 09/433,104 (now U.S. Patent No. 6,636,615), 09/616,462 (now U.S. Patent No. 6,332,031), 09/625,577 (now U.S. Patent No. 6,788,800), 60/232,163, PCT/US01/23336 (published in English as WO 02/09019) and PCT/US01/28523 (published in English as WO 02/23468), which are each hereby incorporated by reference.

*Please amend the specification at paragraph 22 as shown below:

[0022] In this implementation, the value of r is a pre-defined constant. The reference may be derived dynamically from the input media signal. Also, the reference may be selected from a table of values so as to select the value of r in the table at the minimum distance from r(x). The adjustment (110) to the host image is selected so as to be imperceptible or substantially imperceptible to a user in an output form of the watermarked signal.

*Please amend the specification at paragraph 30 as shown below:

[0030] A related approach is to use a weighted average as follows. For each block, the detector computes a weighted average of r(x), where x is over all M selected coefficients (124),

R = Sum_of_(weight_for_location_x * r(x)).

In this approach, the weights are fixed positive constants, ~~constant,~~ independent of the image, with the weight sum equal to 1. For copy detection applications, the weight for each location is adapted for printers and printing substrates used to produce original printed items. The weighting factors are determined such that, for these printers and substrates, originals will be statistically optimally differentiated from copies. Based on our experiments, the weights in higher frequency components are usually higher. However the weights in the highest frequency components are actually tuned lower, because some reproduction devices (like photo copy machines) capture the highest frequency reasonably well, and the first (original) printing process introduces noise to the highest frequency components in the original printed items.

*Please amend the specification at paragraph 47 as shown below:

[0047] When content is watermarked with a unique identifier (ID), any receiver with a watermark detector can monitor what content is retrieved. The content can be identified by name via resolving the ID in a secondary database that contains at least IDs and related names, potentially including content owners who should be informed that the content was distributed. The assignee has several patent applications related to this invention. See, for example, U.S. Patent Application Nos. 09/571,422, filed May 15, 2000 (now U.S. Patent No. 6,947,571), 09/563,664, filed May 2, 2000 (now U.S. Patent No. 6,505,160), and 09/574,726, filed May 18, 2000, which are incorporated herein by reference.

*Please amend the specification at paragraph 78 as shown below:

[0078] One way to detect ~~that a detect~~ whether a printed object (e.g., a document, label, ticket, box) has been copied is to embed two watermark signals with different characteristics that change differently in response to reproduction operations such as photocopying, or digital scanning and re-printing. To differentiate a copy from an original, the watermark decoder measures the characteristics of both watermarks in a digital image scan of the printed object, and detects a copy by the changes in the watermarks attributable to reproduction operations. Examples of this approach are described in U.S. Patent Application No. 09/433,104, entitled Methods and Systems Using Multiple Watermarks, by Geoff Rhoads and Ammon Gustafson, which is hereby incorporated by reference. Four approaches are listed in this document, including:

1. high and low spatial resolution watermarks;

2. one watermark with a geometrically linear assignment of pixels and another with a random assignment of pixels;

3. low and high power watermarks; and

4. one watermark with a standard RGB to HSI – HSI to RGB transform and a second watermark that is biased before being transformed from HSI to RGB.

*Please amend the specification at paragraph 83 as shown below:

[0083] As discussed above a fragile (or semi-fragile) watermark is designed to degrade or alter when copied. An authentication metric is included in a digital watermark signal to help measure or gauge such degradation. In this sense an authentication metric provides a benchmark. An authentication metric is preferably a measure or characteristic of an original digital watermark signal. To detect a potential alteration, a digital watermark detector computes a metric for a potentially corrupted version of the digital watermark signal. The detector then compares its computed metric to the embedded metric to detect whether an alteration has occurred. An alteration ~~alternation~~ may include printing, scanning, copying or editing of the digital watermark signal. An alteration typically occurs when the host media signal is similarly altered.

*Please amend the specification at paragraph 91 as shown below:

[0091] With reference to Fig. 5, Detector/Metric Module 32 reads and decodes the digital watermark embedded within media 30. (As with Detector/Metric Module 18 illustrated in Fig. 3, the detector functions and metric functions of module 32 need not be carried out by the same module or application. Indeed, a separate detector module and a metric module can be employed.). Detector 32 preferably decodes metric 20. For example, if metric 20 is embedded as a payload or plural-bit message, detector **32** ~~20~~ reads and decodes the payload or message. Or if metric 20 is a separate component or signal, detector **32** similarly reads and interprets metric 20. Detector/Metric module 32 analyzes the watermark signal embedded within media 30 to determine metric 34. Preferably, metric 34 is generated (or calculated) based on the same (or corresponding) criteria, algorithm or method as is used to generate ~~generated~~ metric 20. For example, if metric module 18 determines metric 20 based

on Fourier characteristics of a watermark orientation signal, then metric module 32 also examines the Fourier characteristics of the watermark orientation signal to determine metric 34. (As an alternative arrangement, a digital watermark includes a payload (or message) indicating how metric 20 was calculated. In this alternative, metric module 32 is versatile, comprising the ability to generate metric 34 according to the specified metric 20 generation criteria. Metric generation criteria and/or metric 20 can even be encrypted for further security.).

*Please amend the specification at paragraph 92 as shown below:

[0092] Comparator 36 compares metric 20 and metric 34 and a result 38 is output or determined. If metric 20 and metric 34 relate the watermarked media 30 is considered authentic and/or unaltered. As discussed in this and in the incorporated by reference patent documents, a fragile watermark degrades or is altered when process (e.g., photocopied, scanned and then printed, etc.). Metric 34 provides a benchmark to gauge this degradation. Accordingly, watermarked media 30 is considered altered/copied if metric 34 does not relate with benchmark metric 20. The term "relate" is defined broadly to encompass a case where the metrics coincide (or match) and a case where metric 34 ~~fall~~ **falls** within predetermined tolerance of metric 20. For example, if metric 34 is within plus/minus 1 - 25% of metric 20, then watermarked media 30 is considered authentic and/or unaltered. (Of course, different tolerance ranges can be used according to authenticity requirements.). Similarly, when metric 20 represents a threshold value, and metric 34 falls sufficiently below the threshold, then metrics 20 and 34 are considered not to relate. The term sufficiently in this case can again be accessed according to a predetermined tolerance range.